

REMARKS/ARGUMENTS

The present Amendment is responsive to the final Office Action mailed June 9, 2009 in the above-identified patent application.

Claims 1, 2, 5-8 and 10-18 are the claims currently pending in the present application.

Claims 1 and 11 are amended to clarify features recited thereby. These amendments are fully supported by Applicant's disclosure see, for example, Specification, page 8, lines 2-4 and Figs. 1 and 2 of the Drawings.

Rejection of Claims 1, 2, 5-8 and 10-18 under 35 U.S.C. § 112, Second Paragraph

Claims 1, 2, 5-8 and 10-18 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

On page 11 of the Examiner's Answer mailed January 3, 2011, the Examiner states that the 35 U.S.C. § 112, second paragraph rejection is withdrawn. Accordingly, no further response to this rejection is believed to be necessary at this time.

Rejection of Claims 1, 11, 12 and 16 under 35 U.S.C. § 102

Claims 1, 11, 12 and 16 are rejected under 35 U.S.C. § 102, as being anticipated by Watkins et al., U.S. Patent No. 4,183,562. Reconsideration of this rejection is respectfully requested.

Claim 1 requires a flanged member configured to be included as a first flanged member in a flanged joint in a pressure equipment device, the first flanged member comprising a first flanged end with a first end surface configured to face the second end surface of the second flanged end of the second flanged member, the first end surface comprising a first load transferring surface through which forces are transferred when assembled together with said corresponding second flanged member, and entirety of the first load transferring surface positioned and configured to face the second end surface, at least a portion of said first load transferring surface in an unstressed condition being concave in a radial direction, such that said at least a portion of said first load transferring surface is curved and defined by a concave curve function.

Claim 11 requires a joint comprising a first flanged member and a second flanged member adapted for a pressure equipment device, said first and second flanged members each comprising at least one flanged end having an end surface comprising a load transferring surface through which forces are transferred when connecting together said first and second flanged members in an assembled state, such that in the assembled state an entirety of said each load transferring surface faces the other load transferring surface, at least the portion of the load transferring surface in an unstressed condition is concave in a radial direction, such that the at least the portion of the load transferring surface is defined by a concave curve function, said load transferring surface is concave in the radial direction over at least an area that is subjected to deformation when the first flanged member is assembled together with said second flanged member.

Watkins discloses a marine riser conduit section coupling and Watkins at Fig. 6 illustrates that upper connecting member 27 includes a flange 37 with an upwardly facing arcuate surface 41, surface 41 being curved or non-linear when viewed in cross section (Watkins, col. 4, lines 18-29). The Office Action cites first end surface E of Watkins which is adjacent to the second end surface E' of the second flanged end (Final Office Action mailed June 9, 2009, page 5).

However, Watkins discloses that the end surface E is a straight line extending in the radial direction. Watkins does not disclose or suggest a first flanged end with a first end surface comprising a first load transferring surface, an entirety of the first load transferring surface positioned and configured to face the second end surface, at least a portion of the said first load transferring surface at an unstressed condition being concave in a radial direction, such that the at least the portion of said first load transferring surface is curved and defined by a concave curve function.

Further, claim 1 requires that any first point on the at least the portion of said first load transferring surface and any second point of the at least the portion of said first load transferring surface directly distal to the first point meet a plane inclined in the radial direction of the first flanged member. Further, claim 11 requires that any first point on the at least portion of said load transferring surface and any second point of the at least the portion of said load transferring surface meet a plane inclined in the radial direction of said first flanged member

Watkins, including end surface E and end surface E' of Watkins, does not disclose or suggest such an inclined plane. Accordingly, Watkins does not disclose or suggest the recitations of claim 1.

Claims 12 and 16 depend from claim 11, and are therefore patentably distinguishable over the cited art for at least the same reasons.

Rejection of Claims 1, 2, 5-8, 10, 14, 15, 17 and 18 under 35 U.S.C. § 103

Claims 1, 2, 5-8, 10, 14, 15, 17 and 18 are rejected under 35 U.S.C. § 103 as being obvious from Buono, U.S. Patent No. 2,940,779. Reconsideration of this rejection is respectfully requested.

Buono discloses a balanced face flange for a pipe 10 adjacent to a welding neck or a collar 18 that includes an annular ceiling face 30 and a flat radial outer face 16. Between the ceiling face 30 and flat radial outer face 16 a gasket 24 is enclosed. Further, Buono discloses that a face 30 preferably tapers uniformly forward from the axis both radially inward and radially outward of the axis (Buono, col. 3, lines 4-11).

Buono does not disclose or suggest an entirety of the first load transferring surface positioned and configured to face a second end surface, and at least the portion of said first load transferring surface, and that at least a portion of the first load transferring surface is concave in the radial direction, such that the at least a portion of the first load transferring surface is curved and defined by a concave curve function, as required by claims 1 and 11.

The Office Action at page 8 acknowledges that Buono fails to disclose a first load transferring surface that is concave and curved in a radial direction as required by claims 1 and 11, however, the Office Action asserts that there is no known criticality associated with the concave curvature of the abutting surface.

A flange member may be provided with an inclined concave end surface in order to prepare it against a convex bulging of the end surface caused by the affixing of the end surface of the flange member to another end surface of a second flange member and by pressure loads on the end surface over time. As explained further in the Specification, page 3, deformation arises in end surfaces for various reasons over time, as a result of which they do not preserve their flatness but become slightly convex, that is, bulge outwards, for example when the bolts connecting the flanges are tightened. As a result of this bulging, contact points between the end surfaces become displaced outwards in the radial direction so that sealing abutment is disturbed between the end surfaces. Accordingly, by providing a concave surface at the time of

manufacture, problems associated with a straight or planar surface are avoided and a convex bulging out can be controlled or eliminated (Specification, page 4, lines 7-29). The above-identified mistaken view in the Office Action may help explain the equating of Buono's tapered surfaces to a load transferring surface that is curved and defined by a concave curve function, as required by claim 1.

Further, Buono does not disclose or suggest a first flanged end with a first end surface comprising a first load transferring surface, the first load transferring surface being concave in the radial direction over at least an area that is subjected to deformation when the first flanged member is assembled together with said second flanged member, and in an unstressed condition any first point on the at least the portion of said first load transferring surface and any second point of the at least the portion of said first load transferring surface directly distal to the first point meet a plane inclined in the radial direction of the first flanged member, as required by claim 1.

Also, Buono does not disclose or suggest the at least one flanged end having an end surface comprising a load transferring surface to which forces are transferred, at least a portion of the load transferring surface being concave in a radial direction, and any first point on the at least the portion of said load transferring surface and any second point on the at least the portion of said load transferring surface directly distal to the first point meeting a plane inclined in the radial direction of said first flanged member, as required by claim 11.

Fig. 2 of Buono illustrates that the flanged face is tapered rearwardly in the radial direction (Buono, col. 1, lines 35-37) and that the point of maximum relief is coincident with the neutral axis 34 of the flange, and the face tapers uniformly forward from said axis both radially inwardly and radially outwardly of the axis 34 (Buono, col. 3, lines 4-8). That is, Buono explains that the neutral axis 34 of the flange is the axis about with the flange tends to flex upon occurrence of internal pressure in the pipe, i.e. the axis of turning moment caused by internal pressure (Buono, col. 3, lines 8-11) and therefore this tapering both radially inwardly and radially outwardly of the axis as shown in Figs. 1 and 2 of Buono, is important.

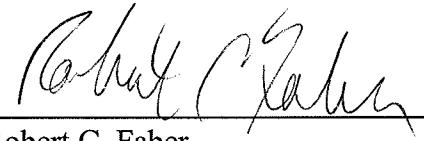
Buono does not disclose or suggest that any first point on the at least the portion of the load transferring surface and any second point of the at least the portion of the load transferring surface directly distal to the first point meet a plane inclined in the radial direction, as required by claims 1 and 11.

Claims 2, 5-8, 10, 14, 15 and 17 depend from claim 1, and are therefore patentably distinguishable over the cited art for at least the same reasons.

In view of the foregoing discussion, withdrawal of the rejections and allowance of the claims of the present application are respectfully requested.

Respectfully submitted,

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